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Date: March 20, 2006

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/Michelle Rhodes/  
Michelle Rhodes

**DOCKET NUMBER**

36856.1131

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s): Tetsuo TAKESHIMA et al.	Art Unit: 2834
Serial No.: 10/680,572	
Filing or 371(c) Date: October 7, 2003	Examiner: M. Budd
Title: PIEZOELECTRIC DIAPHRAGM AND PIEZOELECTRIC ELECTROACOUSTIC TRANSDUCER USING THE SAME	

**REQUEST FOR RECONSIDERATION**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated December 20, 2005, please reconsider the above-identified application in view of the following remarks.

**Listing of the Claims** begins on page 2. No amendments have been made to the Claims.

**Remarks/Arguments** begin on page 6 of this paper

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This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

Claim 1 (original): A piezoelectric diaphragm comprising:

a multilayer ceramic body including a plurality of piezoelectric ceramic layers, principal-surface electrodes disposed on upper and lower principal surfaces of the multilayer ceramic body, and an internal electrode provided at an interface between adjacent piezoelectric ceramic layers; wherein

flexure vibration occurs in the piezoelectric diaphragm when an AC signal is applied between the internal electrode and the upper and lower principal-surface electrode;

the upper and lower principal-surface electrodes are electrically connected to each other via a first side surface electrode disposed on one side surface of the multilayer ceramic body;

the internal electrode is electrically connected to a second side surface electrode disposed on a side surface that is different from the side surface on which the first side-surface electrode is provided;

the second side surface electrode is electrically connected to a lead electrode disposed on at least on the upper principal surface of the multilayer ceramic body;

the upper and lower principal surfaces of the multilayer ceramic body being substantially entirely covered with a resin layer;

a first cutout being formed in a side-edge portion, along the first side surface electrode, of the upper resin layer such that the upper principal-surface electrode is partially exposed in the first cutout;

a second cutout being formed in a side-edge portion, along the first side surface electrode, of the lower resin layer such that the lower principal-surface electrode is partially exposed in the second cutout; and

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a third cutout being formed in a side-edge portion, along the second side surface electrode, of the upper resin layer such that the lead electrode is exposed in the third cutout, and

the first and second cutouts formed in the upper and lower resin layers, respectively, are at locations that do not oppose each other.

Claim 2 (original): A piezoelectric diaphragm according to claim 1, wherein the multilayer ceramic body has a substantially rectangular shape.

Claim 3 (original): A piezoelectric diaphragm according to claim 1, further comprising a case and a lid, wherein the multilayer ceramic body is disposed in the case and sealed in the case by the lid.

Claim 4 (original): A piezoelectric diaphragm according to claim 3, wherein the case includes at least one sound hole.

Claim 5 (original): A piezoelectric diaphragm according to claim 1, wherein the plurality of piezoelectric ceramic layers are polarized in the same direction.

Claim 6 (original): A piezoelectric diaphragm according to claim 1, wherein the internal electrode has a substantially rectangular shape.

Claim 7 (original): A piezoelectric diaphragm according to claim 1, further comprising a dummy electrode disposed between at least two adjacent ones of the plurality of piezoelectric ceramic layers.

Claim 8 (original): A piezoelectric diaphragm according to claim 7, wherein the dummy electrode has a shape of an incomplete rectangular frame lacking one side.

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Claim 9 (original): A piezoelectric diaphragm according to claim 7, wherein the dummy electrode is arranged such that three sides of the internal electrode are surrounded by the dummy electrode via a gap.

Claim 10 (original): A piezoelectric diaphragm according to claim 7, wherein the dummy electrode is exposed at four side surfaces of the multilayer ceramic body.

Claim 11 (original): A piezoelectric diaphragm according to Claim 1, wherein each of the upper and lower resin layers is made of a material having a Young's modulus in the range of about 500 MPa to about 15000 MPa.

Claim 12 (original): A piezoelectric diaphragm according to Claim 1, wherein each of the upper and lower resin layers has a thickness of about 5  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

Claim 13 (original): A piezoelectric diaphragm according to claim 1, wherein the first cutout formed in the side-edge portion, along the first side surface electrode, of the upper resin layer is located near one end of the side-edge portion, the second cutout formed in the side-edge portion, along the first side surface electrode, of the lower upper resin layer is located near the opposite end of the side-edge portion, and the third cutout formed in the side-edge portion, along the second side surface electrode, of the upper resin layer is located near either one of the two ends of the side-edge portion.

Claim 14 (original): A piezoelectric electroacoustic transducer comprising:  
a piezoelectric diaphragm according to claim 1;

a housing in which the piezoelectric diaphragm is housed, the housing having a supporting portion for supporting the piezoelectric diaphragm at two opposing sides of the piezoelectric diaphragm or at corners of the piezoelectric diaphragm or over the

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entire perimeter of the piezoelectric diaphragm, a pair of terminals, one end portion of each terminal being exposed, at a location near the supporting portion, on the inner side wall of the housing, the other end portion of each terminal being exposed on the outer surface of the housing; wherein

a portion, exposed in the first cutout, of the upper principal-surface electrode is connected to the one end portion of one terminal via a conductive adhesive, and the lead electrode, exposed in the third cutout, is connected to one end portion of the other terminal via a conductive adhesive.

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REMARKS/ARGUMENTS

Claims 1-14 are pending in this application.

Claims 7-10 were rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. Particularly, the Examiner alleged that the term "dummy electrode" has no specific definition in this art area, and thus, that the metes and bounds of claims 7-10 cannot be properly determined. Applicants respectfully disagree.

The "dummy electrode" recited in claims 7-10 is clearly and specifically defined in the paragraph bridging pages 9 and 10 of the originally filed specification. Particularly, the paragraph bridging pages 9 and 10 of the originally filed specification discloses:

a dummy electrode 6 is disposed between the ceramic layers 2a and 2b. ... The dummy electrode 6 preferably has the shape of an incomplete rectangular frame lacking one side, and the dummy electrode 6 is disposed such that three sides of the internal electrode 5 are surrounded by the dummy electrode 6 via a gap. The dummy electrode 6 is exposed at four side surfaces of the multilayer ceramic body 2, wherein at one side surface of the multilayer ceramic body 2, the internal electrode 5 is also exposed. ... The side surface electrode 9 has a length that is smaller than the length of one side of the multilayer ceramic body 2 so that the side surface electrode 9 is not electrically connected to the dummy electrode 6.

Since Applicants can be their own lexicographer, regardless of whether or not the term "dummy electrode" has a specific meaning in this art area, Applicants respectfully submit that claims 7-10 are clear and definite because the term "dummy electrode" is clearly defined in the originally filed specification.

Furthermore, contrary to the Examiner's allegations, the term "dummy electrode" does, in fact, have a specific meaning in the art area. The term "dummy electrode" means an element made of a conductive electrode material that is electrically isolated or insulated from other electrical elements, such as internal electrodes. The Examiner's attention is directed to U.S. Patent No. 6,912,288 which clearly demonstrates that the term "dummy electrode" has a specific meaning in the art area.

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Claims 1-14 were rejected under 35 U.S.C. § 102(e) as being anticipated by Takeshima et al. (U.S. 6,794,799). Applicants respectfully traverse the prior art rejection of claims 1-14 over Takeshima et al.

Applicants previously submitted a Declaration under 37 C.F.R. § 1.132 with the Request for Reconsideration filed on June 15, 2005, which indicated that Mr. Tetsuo Takeshima (1) is an inventor in the present application, (2) invented all of the subject matter disclosed in U.S. Patent No. 6,794,799 and relied on in a prior art rejection of the claims of the present application, and (3) invented the common subject matter disclosed in U.S. Patent No. 6,794,799 and the present application. Therefore, Applicants respectfully submit that Takeshima et al. '799 is disqualified as prior art in a rejection of the claims of the present application under 35 U.S.C. § 102(e). For the Examiner's convenience, Applicants enclose herewith a copy of the previously submitted Declaration under 37 C.F.R. § 1.132.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-14 under 35 U.S.C. § 102(e) as being anticipated by Takeshima et al. (U.S. 6,794,799).

In view of the foregoing remarks, Applicants respectfully submit that claims 1-14 are allowable.

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

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The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

Dated: March 20, 2006

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PATENT  
36856.1131

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Tetsuo TAKESHIMA et al. Serial No.: 10/680,572 Filing Date: October 7, 2003 For: <b>PIEZOELECTRIC DIAPHRAGM AND PIEZOELECTRIC ELECTROACOUSTIC TRANSDUCER USING THE SAME</b>	Art Unit: 2834  Examiner: M. Budd
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DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

1. I, Tetsuo TAKESHIMA, hereby declare that I am an inventor in the present application.
2. I, Tetsuo TAKESHIMA, hereby declare that I invented all of the subject matter disclosed in U.S. Patent No. 6,794,799 and relied on in a prior art rejection of the claims in the presently pending U.S. Patent Application No. 10/680,572.
3. I, Tetsuo TAKESHIMA, hereby declare that I invented the common subject matter disclosed in U.S. Patent No. 6,794,799 and the presently pending U.S. Patent Application Serial No. 10/680,572.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Tetsuo Takeshima  
Tetsuo TAKESHIMA

5/25/2005  
Date

JFW

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MAR 20 2006

**OFFICE OF PETITIONS****To:** Examiner M. Budd**From:** Christopher A. Bennett**Fax:** 571-273-0025 ~~8300~~**Date:** March 20, 2006**Phone:** 571-272-2019**Pages:** 10**Re:** 10/680,572**CC:**

36856.1131

**•Comments:**

Examiner Budd,

Please find attached hereto the following documents for the above-identified application:

1. Request for Reconsideration; and
2. Declaration under 37 C.F.R. § 1.132;

Respectfully submitted,

/Christopher A. Bennett #46,710/

Christopher A. Bennett  
for  
Keating & Bennett, LLP  
(Registration Number 46,710)